CLAIMS

[cl001] 1. A dental curing light comprising:

a primary heat sink suitable for drawing heat away from a semiconductor chip,

a well on said primary heat sink, said well being configured for mounting of a semiconductor chip therein,

a light emitting semiconductor device located in said well, and

a secondary heat sink, said secondary heat sink having a greater internal volume than said primary heat sink, said primary heat sink being mounted to said secondary heat sink.

[cl002] 2. A dental curing light as recited in claim 1 further comprising:

a mounting platform located on said secondary heat sink, said primary heat sink being mounted on said mounting platform.

[cl003] 3. A dental curing light as recited in claim 1 wherein said secondary heat sink is an elongate structure having a longitudinal axis.

[cl004] 4. A dental curing light as recited in claim 1 wherein said light emitting semiconductor device is mounted in said well by use of an adhesive selected from the group consisting of light reflective adhesive and heat conductive adhesive.

[cl005] 5. A dental curing light as recited in claim 1 wherein said light emitting semiconductor device is selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip array, surface emitting laser chips, edge emitting laser chips, and VCSEL chips.

[cl006] 6. A dental curing light as recited in claim 1 wherein said light emitting semiconductor device utilizes a driving current of not more than about 350 millliamps.

[cl007] 7. A dental curing light as recited in claim 3 wherein said light emitting semiconductor device is oriented so that light emitted from said light emitting

semiconductor device is emitted generally orthogonal to said secondary heat sink longitudinal axis.

[cl008] 8. A dental curing light as recited in claim 3 wherein said light emitting semiconductor device is oriented so that light emitted from said light emitting semiconductor device is emitted at generally a 30 to 150 degree angle to said secondary heat sink longitudinal axis.

[cl009] 9. A dental curing light as recited in claim 3 wherein said mounting platform is oriented so that light emitted from said light emitting semiconductor device is emitted at generally a 45 to 135 degree angle to said secondary heat sink longitudinal axis.

[cl010] 10. A dental curing light as recited in claim 1 wherein at least one of said primary heat sink and said secondary heat sink includes material selected from the group consisting of copper, aluminum, silicon carbide, boron nitride, natural diamond, monocrystalline diamond, polycrystalline diamond, polycrystalline diamond compact, diamond deposited through chemical vapor deposition, and diamond deposited through physical vapor deposition.

[cl011] 11. A dental curing light as recited in claim 1 wherein said light emitting semiconductor device includes a substrate and epitaxial layers grown thereon.

[cl012] 12. A dental curing light as recited in claim 11 wherein said substrate is selected from the group consisting of Si, GaAs, GaN, InP, sapphire, SiC, GaSb and InAs.

[cl013] 13. A dental curing light as recited in claim 11 wherein said epitaxial layers include at least one active layer, at least one cladding layer, at least one buffer layer, and at least one contact layer.

[cl014] 14. A dental curing light as recited in claim 11 wherein at least one of said epitaxial layers includes GaN.

[cl015] 15. A dental curing light as recited in claim 1further comprising a cover over said light emitting semiconductor device.

[cl016] 16. A dental curing light as recited in claim 15 wherein said cover is transparent.

[cl017] 17. A dental curing light as recited in claim 15 wherein said cover is a focus lens.

[cl018] 18. A dental curing light as recited in claim 1 wherein said well includes a light reflective coating on its interior.

[cl019] 19. A dental curing light as recited in claim 1 further comprising electronic circuitry for controlling operation of the dental curing light; wherein said electronic circuitry is capable of providing pulsed current input to said light emitting semiconductor device.

[cl020] 20. A dental curing light as recited in claim 1 further comprising a thermoelectric cooler on said secondary heat sink, said thermoelectric cooler assisting in heat dissipation.